

Remarks

Reconsideration and withdrawal of the outstanding objections and rejections, in consideration of this submission, is respectfully requested.

A number of revisions were implemented in the Specification to correct discovered informalities.

With the amendments to the claims, outstanding matters specified under the heading "*Claim Objections*," in Item 1 of the detailed action, have been overcome. The informalities specified in Item 1, on pages 2-3 of the Official Action, concerned the presence of duplicate expressions (see claims 2 and 17) and misspellings (see claims 23, 24 and 48). The amendments made to the claims have rendered moot all such concerns. Further revisions were also implemented in the claims that are strictly of a minor formatting nature as well as to correct minor typographical errors discovered therein. It is submitted, all such changes made are strictly of a minor formal nature.

Regarding the double patenting matter raised in Item 1 of the detailed action, it is alleged that claims 8 and 16 of the present application are in conflict with pending claims 1 and 12 of the corresponding CIP U.S. Appln. Serial No. 10/639,531. A reading of claims 1 and 12 of USSN 10/639,531 shows that the invention covered therein is limited to determining at least two (2) Doppler Spreads, i.e., a Doppler Spread of each of the set forth plurality of radio signals, and using the plural Doppler Spreads to determine the speed of a mobile station. Therefore, there is clearly no equivalence of scope between the claims of the present application and that of the corresponding CIP application. In other words, a clear line of demarcation has been maintained between claims 1 and 12 of the corresponding CIP application with that of claims 8 and 16 of the present application, respectively.

Applicants note with appreciation the indication of allowable subject matter. Specifically, from Item 4, on page 8 of the Official Action, claims 17-24 and 48 are directed to allowable subject matter and that they would be formally allowed upon obviating the outstanding objections thereto and upon being re-presented in an appropriate self-contained format. As explained hereinabove, in view of the corrective revisions implemented in the claims, any such previously outstanding matters have been rendered moot. It is also noted from Item 6, on page 10 of the Official Action, that claims 6, 7, 13-15, 25, 31, 32, 38, 39, 41-47 and 49 are directed to allowable subject matter and that they would be formally allowed upon being re-presented in an appropriate self-contained format. As will be shown hereinbelow, however, the invention according to claims 1+, 8+, 16+, 26+, 33+ and 40+ could not have been achievable in a manner as that alleged in the outstanding rejections. Accordingly, the re-presenting of the objected to claims in an appropriate independent claim format is deemed unnecessary.

According to the outstanding Office Action, claims 1-3, 8-10, 26-28 and 33-35 stand rejected under 35 USC §103(a) as unpatentable over Lu et al (USP 6,449,489) in view of Winters et al (USP 6,505,053); and claims 4, 5, 11, 12, 16, 29, 30, 36, 37 and 40 stand rejected under 35 USC §103(a) as unpatentable over the same combination of Lu in view of Winters et al and further in view of Mallette et al (USP 6,636,574). As will be shown hereinbelow, the invention according to these claims could not have been rendered obvious in the manner as that alleged in the rejections. Therefore, insofar as presently applicable, these rejections are traversed and reconsideration and withdrawal of the same is respectfully requested.

The present invention is concerned with estimating Doppler Spread and, also, estimating mobile station speed from Doppler Spread. For example, the method according to independent claim 1 calls for computing an estimate of the

Doppler Spread of a radio signal being received from the derivative value of the envelope of the path transfer function for the radio signal. Independent claim 26, likewise, calls for computing an estimate of the Doppler Spread of the radio signal from the derivative value of the path transfer function envelope of a radio signal, received by the receiver means of the mobile station. Independent claims 8, 16, 33 and 40, moreover, are directed to a method and a mobile station with regard to a wireless communication scheme in which the speed of the mobile station is estimated on the basis of the above-computed Doppler Spread estimate. An example of the method for estimating the Doppler Spread as well as estimating mobile station speed on the basis of the estimated Doppler Spread is described (in the Specification) with regard to the flow charts shown in Figs. 3 and 4 of the drawings (see in particular steps s27-s31). The speed selection process such as detailed in the example flow chart shown in Fig. 5 of the drawings and described beginning on page 10, line 27, of the Specification, determines whether both the high and low speed estimate processes have produced reliable estimates. With regard to the latter, see for example claims 16+. The various details regarding the derivation of the derivative value of the path transfer function envelope pertaining to the radio signal as well as the particularities regarding the computing of the Doppler Spread estimate are set forth with regard to various ones of the dependent claims of the respective independent claims.

Lu, on the other hand, is concerned with determining Doppler shift and not Doppler Spread such as presently called for in each of the independent claim groups including claims 1+, 8+, 16+, 26+, 33+ and 40+. It is admitted (in the rejection) of claims 1, 8, etc., that Lu does not specifically disclose the set forth aspect of "deriving a value for the derivative of the envelope of the path transfer function for said radio signal." Winters was cited as "[disclosing] deriving a result

after the complex envelope of the received signal passes through the filtering process (column 3, lines 24-29 and column 8, lines 33-35)" and that on this basis it would have been "obvious to one of ordinary skill ... to provide the technique of Winters to the system of Lu in order to provide an improved performance in wireless mobile communication networks by improving the ability of the system to correct for fading behavior."

As noted above, Lu was concerned with determining Doppler shift while the present claimed subject matter specifically calls for estimating the Doppler Spread and, also, estimating the mobile station speed on the basis of the estimated Doppler Spread and not based on Doppler shift. The following brief discussion regarding both Doppler Shift and Doppler Spread highlights the differences therebetween.

The Doppler Shift is the degree to which a signal becomes frequency shifted as a result of the relative motion between a transmitter and receiver. With regard to a multipath system, i.e., a system in which a transmitted signal follows different propagation paths, the radio signal from a transmitter to a receiver travels along different propagation paths as the signal is scattered by obstacles, such as houses and other objects, which leads to reflection of the signal by different objects. This leads to signals being received by the receiver with different time delays. If there is relative motion between the transmitter and the receiver, the signals following different paths may have different Doppler Shifts. Doppler Spread, however, is the frequency range between the lowest and highest of the Doppler Shifts. Such, it is submitted, is clearly distinctly different from that taught by Lu, which is concerned with determining Doppler Shift.

Winters taught a scheme for predicting fading. It can be said, therefore, that Winters would have been relevant to one of ordinary skill if the intent is to improve the ability of a radio communications system to effect corrections for signal fading.

However, as set forth in each of the claims 1+, 8+, 16+, 26+, 33+ and 40+, the present invention is directed to a method and mobile station, in connection with a wireless communication scheme, calling for estimating the Doppler Spread of a radio signal being received, in clear contradistinction with that disclosed or inferred from Winters disclosure. Moreover, the present invention also sets forth a scheme in which the Doppler Spread estimation is performed in order to estimate the speed of the mobile station. (See claims 8+, 16+, 33+ and 40+). Such, it is submitted, could not have been realized even in view of the combined teachings of Lu and Winters for at least the above reasons. That is, even combinedly, Lu and Winters still would not have suggested the need to estimate a Doppler Spread, such as presently called for.

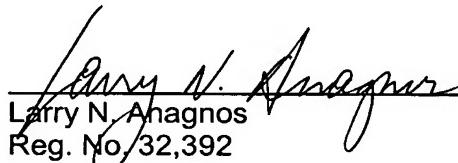
Mallette et al taught that Doppler Spread is estimated on the basis of estimated autocorrelation function or is based on an estimated autocovariance function of the magnitude squared of the impulse response of a channel over which a signal is communicated. (Column 2, lines 7-15, and lines 48-54, in Mallette et al.) It is clearly apparent, therefore, that Mallette et al taught a clearly different scheme from that of Lu and Winters. The Doppler Spread scheme according to Mallette et al, it is submitted, is different from that set forth according to claims 1+, 8+, 16+, 26+, 33+ and 40+. As indicated earlier, the present inventors set forth a scheme in which the Doppler spread estimation of an incoming radio signal is achieved on the basis of deriving a value of the derivative of the envelope of the path transfer function for the radio signal. In fact, the further characterizing aspects regarding the attainment of the Doppler Spread estimation such as set forth in one or more of the dependent claims with regard to each of the independent claim groups could not have been realized even over the combined teachings of Lu, Winters and Mallette et al, such as applied in the outstanding rejections. Noting the differences in

emphasis of the respective disclosures of Lu, Winters and Mallette et al, there is no teaching therefrom, it is submitted, that would have led one of ordinary skill to modify Lu in a manner as that alleged in the outstanding rejections. For at least the above reasons, the invention according to claims 1-5, 8-12, 16, 26-30, 33-37 and 40 could not have been realizable in the manner alleged in the outstanding rejections.

Therefore, in view of the amendments presented hereinabove together with these accompanying remarks, reconsideration and withdrawal of the outstanding objections and rejections as well as favorable action on all of the presently pending claims, i.e., claims 1-49, and an early formal notification of allowability of the above identified application is respectfully requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in the fees due in connection with the filing of this paper, to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Dep. Acct. No. 01-2135 (1076.41204X00), and please credit any excess fees to such deposit account.

Respectfully submitted,
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